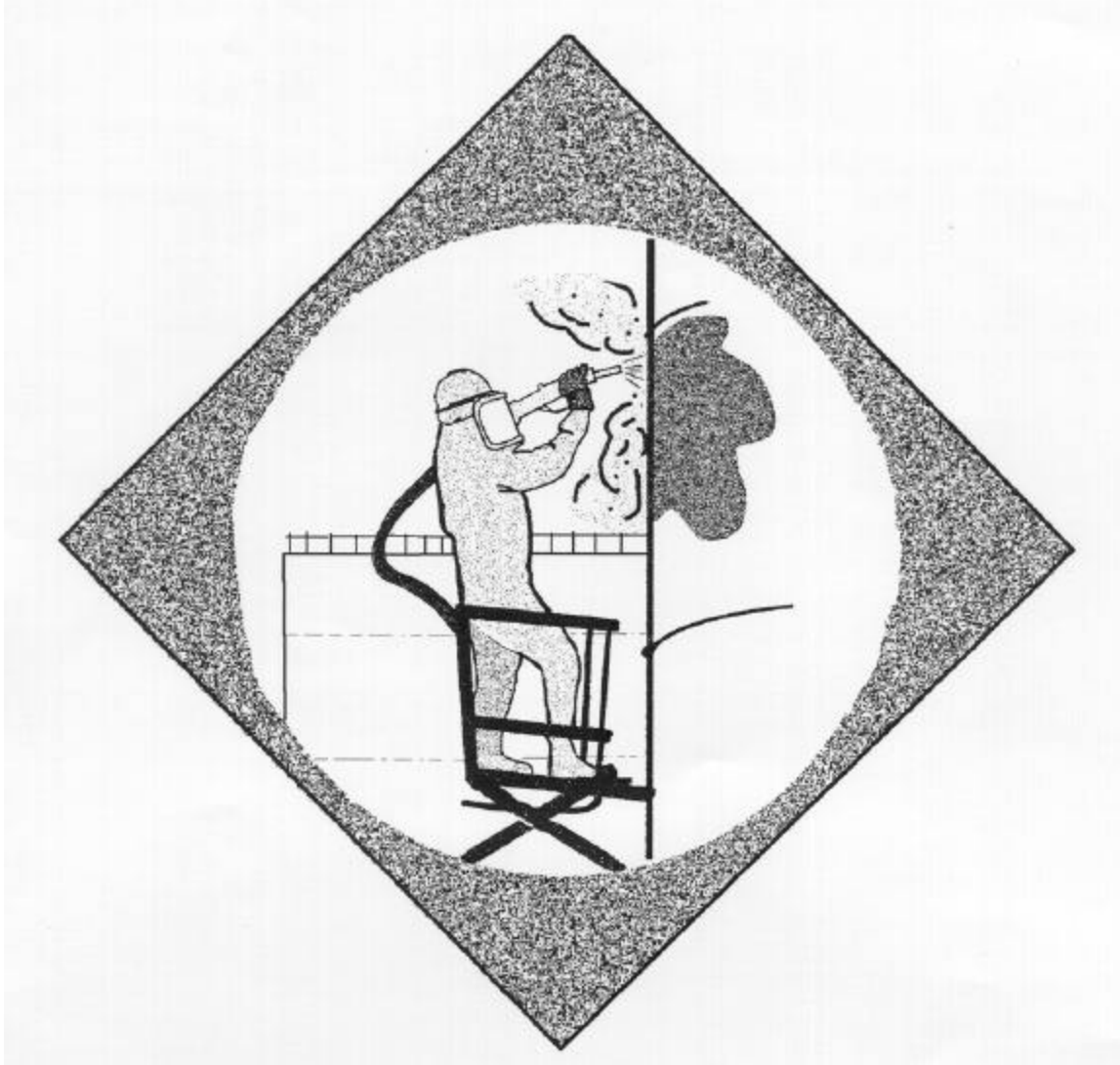


DRAFT

ENVIRONMENTAL GUIDELINE

For

Waste Lead and Lead Paint



Guideline for the Management of Waste Lead and Lead Paint

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Guideline for the Management of Waste Lead and Lead Paint

1 Introduction

Waste products that contain lead are considered contaminants under the Northwest Territories' *Environmental Protection Act* (EPA) and must be managed as a hazardous waste. This guideline presents a brief introduction into the management of waste lead and lead containing products. It is intended as a source of basic information and does not replace the existing legislation, which is referenced throughout.

Historically, lead was used in many commercial products including: paint, gasoline, insecticides and batteries, to name a few. We now know that products and structures painted with leaded paint are a source of health and environmental contaminants. Lead in gasoline and household paints is now restricted by federal legislation, as are lead pellet shotgun shells used for hunting migratory birds.

Lead is toxic to living organisms and if released into the environment can bioaccumulate and enter the food chain. Products that contain lead in excess of 500 parts per million (0.05% by weight) are considered hazardous waste and shall be managed in accordance with this guideline.

This document should be read in conjunction with the Guideline for the General Management of Hazardous Waste In The NWT (referred to as the General Guideline), and, the Guideline for the Management of Waste Institutional - Commercial and Industrial Chemicals. Management of lead acid batteries is addressed under the Guideline for the Management of Waste Batteries.

Section 2.2 of the EPA gives the Minister of Resources, Wildlife and Economic Development the authority to develop, co-ordinate and administer these guidelines. Other Acts and Regulations are also in place to protect workers and the public from the effects of lead exposure. Please contact the appropriate agency before proceeding on projects involving waste lead and lead paint.

1.1 Definitions

Controlled product Any product, material or substance specified under paragraph 15(1)(a) of the *Hazardous Products Act* (Canada) and its regulations.

Fume The smoke-like vapour given off from heated metals.

<i>Generator</i>	The owner or person in charge of management or control of a hazardous waste at the time it was generated, or a facility that generates hazardous waste.
<i>Leaded paint</i>	Structural coatings containing greater than 500 parts per million (0.05% by weight).
<i>Metallic lead</i>	The solid metal form of lead, bluish-white or silvery-grey in colour. By weight, it is heavy and is also soft, which makes it ductile and malleable. Other desirable properties are that it is a poor conductor of electricity, it has a low melting point and it is resistant to corrosion. Examples include ammunition, electrical storage batteries (lead acid batteries), lead solder, pipes, sheaths for electrical cable and radiation shields.
<i>Organic lead</i>	In general, lead combined with a chemical compound containing carbon. These chemical compounds are usually in powder, crystal, paste or liquid form, depending on the compound. Examples include tetraethyl lead (used as an anti-knock agent in gasoline), tetramethyl lead, lead naphthanate, stearate and oleat.
<i>Inorganic lead</i>	In general, lead substances that <u>do not</u> contain compounds of carbon, hydrocarbons or derivatives. These chemical compounds are usually found in powder or crystal form, but some are liquid. Examples of inorganic lead compounds include frits, glasses, insecticides, specific paints, pigments, plastics and rubber compounds.
<i>Transport authority</i>	The regulations controlling the management of hazardous waste under specified modes of transport. They include: <u>Road and rail</u> <i>Transportation of Dangerous Goods Act (TDGA) and Regulations (TDGR)</i> <u>Air</u> <i>International Civil Aviation Organization (ICAO) Technical Instructions</i> <u>Marine</u> <i>International Maritime Dangerous Goods Code (IMDG)</i>

1.2 Potential Effects

Metallic lead

Fumes – Lead fumes inhaled during melting operations pose an acute health risk to people. They can also be an accumulative poison and if exposure continues, chronic health symptoms and disability occur. The major areas affected are the nervous system, blood system and kidneys.

Dust – Metallic lead can also enter the body through breathing dust from activities such as sandblasting of lead paint. If inhaled, lead particles smaller than 10 microns (one-millionth meter) can move directly into the bloodstream through the lungs.

Another source of occupational lead exposure is by accidental ingestion as workers handle cigarettes or food when their hands are contaminated with lead dust.

Contact with Water – Metallic lead is not water soluble between the pH range of 5 and 12. If prevented from contacting water or water vapour, it will not leach into the environment.

Organic lead

These chemical compounds are generally toxic by inhalation, ingestion and skin absorption. With skin absorption being the primary route of exposure, it readily penetrates the skin directly or is dissolved in oils, which can penetrate the skin. Many organic lead compounds are also flammable or carcinogenic. Ingestion of leaded paint dust and chips has been shown to retard mental and physical growth in children.

Inorganic lead

These chemical compounds are generally toxic by inhalation or ingestion. Skin absorption is generally insignificant for both metallic and inorganic lead.

Hazardous Effect Ratings

	inhalation	ingestion	skin absorption
Metallic lead	High (extreme when heated)	Medium	Low
Organic lead	Medium	High	High
Inorganic lead	Low	High	Low

1.3 Common Sources of Lead

Metallic Lead

Automotive industry:	wheel weights, bearings, friction additive in clutch facings and brakes, storage batteries
Construction industry:	flashing, pipe, sheeting, counterweights, paint additives
Electronic industry:	cathode-ray tubes, radiation shielding, solder
Resource industry:	fishing sinkers, rifle bullets, backstops at rifle and pistol ranges
Printing industry:	letter blocks

Organic Lead

Miscellaneous:	paint, insecticides, fungicides, chemical reagents, gasoline additives, pigments, dyes
Automotive industry:	spent glycol solution removed from cooling systems with heat exchangers made from alloys containing lead as an adhesive

Inorganic Lead

Oil field construction:	joining compound (pipe dope)
Automotive industry:	ceramic products, paints, rubbers, dyes, corrosion inhibiting pigment in paints and primers
Miscellaneous:	manufacture of explosives, blasting caps, matches and pyrotechnics, chemical reagents, pigments, dyes

2 Roles and Responsibilities

2.1 Environmental Protection

The **Environmental Protection Service** (EPS) is part of the Government of the Northwest Territories' (GNWT) Department of Resources, Wildlife and Economic Development. EPS is the agency responsible for control of how contaminants are discharged and their impact on the natural environment. It is responsible for ensuring environmentally acceptable management procedures, emission levels and disposal methods are maintained in the NWT.

EPS programs are applied primarily to Commissioner's Land, municipal lands or lands involving GNWT activities. Legislative authority is provided by the *Environmental Protection Act* (EPA) and *Pesticide Act*. Contact EPS for a listing of relevant regulations and guidelines or visit the web site at www.gov.nt.ca/RWED/eps/leg.htm.

2.2 Occupational Health and Safety

The **Prevention Services Division of the Workers' Compensation Board** regulates worker protection from air-borne lead and other toxic materials. The *General Safety Regulations*, under the *Northwest Territories Safety Act*, require that employee exposure to hazardous air-borne dust be maintained below specified levels. The specified exposure levels correspond to the type of materials in use and are listed in the Schedule to the regulations.

Contact the Prevention Services Division for regulations and procedures to prevent worker exposure to toxic materials. This includes lead abatement projects (leaded paint removal), handling products containing lead or the grinding, cutting or welding of products coated in leaded paint. Also included are worker protection measures for use during clean up of backstops at rifle and pistol ranges.

2.3 Public Health and Safety

The **Department of Health and Social Services** has the authority for public health and safety. The *General Sanitation Regulations*, under the authority of the *Public Health Act*, are the legislation used to protect the public from materials or activities that are injurious to public health. As an example, lead abatement projects which use sand or abrasive blasting to remove leaded paint from steel structures have the potential to adversely impact on public health. Responsible management of such projects means consulting with an Environmental Health Officer.

2.4 Generators

The responsibility for proper waste management rests with the generator and should be considered part of the “cost of doing business”.

Identification of lead in organic and inorganic lead-based chemicals is accomplished by review of the Material Safety Data Sheets (MSDS), which must accompany all controlled products distributed in Canada. Manufacturers or their product distributors are required to provide an MSDS with their products.

Alternate resources may be required to identify older products suspected of containing lead. Analysis by an accredited laboratory is one option. Laboratories can be contacted through their associations listed in the General Guideline, Appendix II.

Management options for lead-containing chemicals (organic or inorganic) are addressed in the Guideline for the Management of Waste Institutional - Commercial and Industrial Chemicals. The General Guideline should also be consulted for generator responsibilities.

Wastes Further Addressed

For the purpose of this guideline, only the following wastes containing lead and their management are further addressed:

- lead paint
- sand or soils used as backstops at rifle and pistol ranges
- soils containing lead at steel structure manufacturing/construction or repair yards

It is the owner's responsibility to identify the presence of lead. Common examples of where lead paint is found include:

- barges and ships, heavy equipment
- steel fabrication/painting facilities
- pipelines
- fuel storage tanks
- steel bridges
- steel towers
- grain storage bins
- rail cars

The owner is responsible for evaluating painted steel structures or fabrication/demolition sites for the presence of lead. Painted tanks or other steel structures should be sampled for confirmation of lead paint and lead concentration prior to sandblasting or other maintenance activities.

In addition to lead, industrial or steel coatings such as paint and paint primer, may contain other contaminants to be aware of such as arsenic, polychlorinated biphenyls (PCBs), cadmium, chromium, copper, magnesium and mercury. These are toxic substances if inhaled or ingested.

Paint Samples

A paint sample should be collected from tightly adhered paint and comprised of all layers of paint, from a one square inch area (2.5 cm). Make sure to scrape down to the metal, being careful not to include any metal in the sample. A plastic bag is an adequate container. The paint should then be analysed, at the owner's expense, at an accredited laboratory. The analytical data should then be forwarded to EPS.

Rifle Range Backstop Samples

Sample collection from rifle range backstops should be done by following the procedures provided by an accredited analytical laboratory to ensure representative samples are obtained.

Soil Samples

Information on the procedures for sampling lead in soil are available from accredited analytical laboratories.

Important Analysis Note

Due to the complex chemical relationship of lead and iron, the Toxic Characteristic Leaching Procedure (TCLP) is not acceptable for lead analysis. Iron masks TCLP detection of lead. The only accepted lead analysis is called "Total Lead". An amendment to exclude lead from TCLP analysis (based on leachate quality test results) will be changed in the Guideline for Industrial Waste Discharges in the NWT, Schedule IV: Standards for Solid Waste/Process Residuals Suitable for Landfill.

2.5 Sandblasting Contractors

Repainting of steel structures for rust protection usually involves sandblasting of the deteriorated paint, in preparation for a new coating of primer and paint. Painted tanks or other steel structures should be sampled for confirmation of lead and lead concentration prior to sandblasting or other maintenance activities. Consultation with the appropriate regulatory agencies prior to starting lead abatement projects is the responsible work strategy to prevent public, worker and environmental impairment.

Sandblasting Media Hazards

The International Agency for Research on Cancer, established by the World Health Organization in 1995, classified crystalline (free) silica as carcinogenic to humans when inhaled in the form of quartz or cristobalite from occupational sources. Selection of a non-hazardous sandblasting medium will reduce the hazard dust levels that need to be controlled and managed as hazardous wastes.

Non-carcinogenic sand types should be specified for sandblasting. Alternately, products like nutshells, solid carbon dioxide or baking soda-based abrasives should be used to remove deteriorated paint. Names of alternate blasting media suppliers are available by contacting the paint associations listed in this document under section 4 Agency Information.

3 Waste Management

Minimising or avoiding the creation of pollutants and wastes can be more effective in protecting the environment than treating or cleaning them up after they have been created. -- Canadian Council of Ministers of the Environment

3.1 Pollution Prevention

"Pollution prevention" methods eliminate the creation of environmental contaminants by preventing the waste from being created in the first place. "Pollution control" methods are geared towards treating the waste after it's created.

Scientific advances in the paint and coatings industry have resulted in the development of superior paints and coatings that provide corrosion resistance on steel structures. Leaded paints are no longer required.

Pollution prevention methods for structures with leaded paint include:

- repainting without complete paint removal
- spot painting, overcoating, zone coating, or deferring painting entirely
- alternatives to sandblasting such as cleaning with vacuum power tools, rotary power tools, vacuum head needle guns, ultra-high pressure water jets and chemical strippers

Because of potential health and environmental hazards, sandblasting should only be considered after a thorough evaluation of the structure and the pollution prevention options.

3.2 Containment of Paint and Abrasive Debris

Regardless of the leaded paint removal method, total containment of the leaded paint and abrasive debris or paint strippers is a requirement of the *Environmental Protection Act*.

A containment system must be used to enclose an entire work area or paint removal tool. It includes cover panels, screens, scaffolds, supports and shrouds. The purpose of such a system is to minimise and prevent any generated debris from entering the environment, and to facilitate the controlled collection of the debris for disposal. Containment systems may also employ the use of ground covers or water booms.

Containment devices include:

- drop sheets or tarps
- shrouding or free-hanging enclosures
- total structure enclosures
- negative pressure containment

3.3 Recovery of Abrasive and Paint Debris

Collection of paint residues must be undertaken frequently to prevent dispersal by wind or by sandblasting operations. A vacuum is recommended as a rapid on-site collection method. Sweeping and shovelling are also used for cleaning abrasives from the ground covers.

Collection containers must not allow sandblasting wastes to spill or leak into the environment. Open-top drums or strong plastic bags are examples of materials that can be used for waste collection and storage, pending disposal.

Debris collection techniques include:

- capture from surface at point of cleaning (vacuum blasting)
- capture from containment enclosures (sweeping, vacuuming)
- capture from ground or over water (tarps, barges)
- channelling debris to specified collection points

3.4 Storage

Lead compounds or materials contaminated with lead must be stored in a safe and secure manner. They should be in leakproof containers to prevent release into the environment. Depending on the material, the packaging should be designed to prevent contact with precipitation or it should be stored indoors.

3.5 Transportation

Lead waste transported to a recycling, treatment, disposal or management facility must be properly classified, packaged, labelled and manifested, as required by the transport authority (air, road, rail, marine), as the case may be. Specific requirements for waste generators, carriers and receivers are detailed in the General Guideline.

Registration numbers, waste manifests and registered hazardous waste carrier lists are available from EPS. Waste management contacts are listed in the General Guideline.

For road transportation purposes, dry leaded paint waste or lead contaminated soils/materials from pistol and rifle range backstops can be classified as shown below.

<u>Shipping Name:</u>	Leachable Toxic Waste (L17)
	Classification: 9.3
	P.I.N.: UN9500
	Packing Group: III

Chemical stripping of lead paint generates both a corrosive waste and a lead leachable waste. The disposal options are the same as that for the dry wastes generated by mechanical means. However, the shipping requirements must reflect the additional hazards of being corrosive.

The shipping requirements will be based on the chemical characteristics of the chemical stripper used to remove the paint. Consultation with the TDGR, IATA or IMDG is recommended.

3.6 Disposal

Metallic Lead

Disposal of metallic lead, such as wheel weights or sheeting, can be done by shipping to a lead or metals foundry, or a metals recycler (metallic lead is not listed in the Dangerous Goods Act and regulations).

Inorganic and Organic Lead Chemical Waste

Management is addressed in the Guideline for the Management of Waste Institution - Commercial and Industrial Chemicals.

Leaded Paint/Soils

Disposal options for leaded paint and sandblast residue, and lead contaminated soils/materials from pistol and rifle range backstops include transport to a registered hazardous waste disposal facility, or a lead or metals foundry. The receiving facility must be registered in the receiving province or territory and approved to manage that waste.

Names of recycling or disposal companies are available by contacting the waste management associations listed in Appendix II of the General Guideline. Generator registration numbers, waste manifests and registered hazardous waste carrier lists are available from the Environmental Protection Service.

Scientific advances in waste product stabilisation and solidification utilising cement, flyash, zeolites, etc., which chemically bind the lead and prevent environmental release are presently under review. EPS may approve the method, subject to conditions, if leachate test results are in accordance with the Guideline for Industrial Waste Discharges in the NWT.

If sandblast medium contains iron, the Toxic Characteristic Leaching Procedure (TCLP) cannot be used to meet requirements of the Guideline for Industrial Waste Discharges in the NWT.

Consideration will be given to proposals for alternate management methods that provide a level of environmental protection equivalent to those discussed in this guideline.

4 Agency Information

4.1 Key to Acronyms

EPA	Environmental Protection Act
EPS	Environmental Protection Service
GNWT	Government of the Northwest Territories
IATA	International Air Transportation Association
ICAO	International Civil Aviation Organisation
IMDG	International Maritime Dangerous Goods Code
MSDS	Material Safety Data Sheets
TCLP	Toxic Characteristic Leaching Procedure
TDGA	Transportation of Dangerous Goods Act
TDGR	Transportation of Dangerous Goods Regulations
General Guideline	Guideline for the General Management of Hazardous Waste in the NWT

4.2 Agency Contacts

Contact these agencies for further information on the proper management of waste lead and lead paint:

Government Departments

- Environmental Protection Service
Department of Resources, Wildlife and Economic Development
Government of the Northwest Territories
600, 5102 - 50 Avenue
Yellowknife, NT X1A 3S8

Phone: (403) 873-7654 Fax: (403) 873-0221
www.gov.nt.ca/RWED/eps/leg.htm

- Motor Carrier Services
Department of Transportation
Government of the Northwest Territories
Box 305, Hay River, NT, X0E 0R0

Phone: (867) 874-5006 Fax: (867) 874-6088

- Prevention Services Division
Workers' Compensation Board
Box 888, Yellowknife, NT, X1A 2R3

Phone: (867) 873-7078 Fax: (867) 873-0262

- Community Health Program
Department of Health and Social Services
Government of the Northwest Territories
Box 1320, Yellowknife, NT, X1A 2L9

Phone: (403) 873-7738 Fax: (403) 873-7706
www.gov.nt.ca/HLTHSS

Paint and Environmental Associations

- Canadian Paint & Coating Association
9900 Cavendish Blvd., Suite 103
St-Laurent, Quebec H4M 2V2

Phone: (514) 745-2611 Fax: (514) 745-2031

- Environmental Services Association of Alberta
Suite #250, 10508 - 82 Avenue
Edmonton, Alberta T6E 2A4

Phone: (780) 429-6363 Fax: (780) 439-4249
www.essa.org

- Steel Structure Painting Council of Canada
(Northern Alberta & Northwest Territories)
c/o Barry Grundy, Regional Manager
Sil Silica
P.O. Box 6100 Station C
Edmonton, Alberta T5B 4K5

Phone: (780) 478-7171 Fax: (780) 472-6984

- Steel Structures Painting Council
40 - 24th Street
Pittsburgh, PA 15222
USA

Phone: (412) 281-2331 Fax: (412) 281-9992
Research Lab
Phone: (412) 268-3325 Fax: (412) 687-1153
www.sspc.org

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